



*TFW* Receipt

UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: ~~SCULLY~~ et al.  
Serial No.: 10/524,927  
Filed: September 29, 2005  
Entitled: Utilization of Waste Gas Streams  
Dkt. No.: M02B149

Group No.: 2812  
Examiner: n/a

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**CERTIFICATE OF MAILING**

I hereby certify that this correspondence and every writing referred to herein as being enclosed is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on April 10, 2006.  
(Date)

Betty Lee

Printed name of person signing this certificate

*Betty Lee*

Signature of person mailing

Dear Sir:

**REQUEST FOR CORRECTED FILING RECEIPT**

Attached is a copy of the official filing receipt, mailed January 18, 2006, received from the PTO in the above application for which issuance of a corrected filing receipt is respectfully requested.

There is an error with respect to the spelling of the first word in the title of the subject application. Please change "Utilisation" to read Utilization. A copy of the Preliminary Amendment which was submitted together with the subject patent application is attached for your reference.

It is believed that the need for correction is not due to any error by applicant and that no fee is due. However, as a precaution, the Commissioner is hereby authorized to charge to Deposit Account No. 02-2865 any fee which may be required. This letter is submitted in triplicate.

Respectfully submitted,

Date:

April 10, 2006

The BOC Group, Inc.  
Legal Services - Intellectual Property  
575 Mountain Ave.  
Murray Hill, NJ 07974  
Tel: (908) 771-6469

*Ira Lee Zebrak*

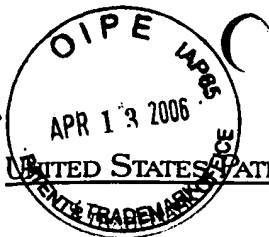
Ira Lee Zebrak, Esq.  
Attorney for Applicants(s)  
Reg. No. 31,147

Attachments  
Official Filing Receipt  
Preliminary Amendment

ILZ:bjl

RECEIVED

JAN 27 2006



UNITED STATES PATENT AND TRADEMARK OFFICE

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APPL NO.	FILING OR 371 (c) DATE	ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	DRAWINGS	TOT CLMS	IND CLMS
10/524,927	09/29/2005	2812	1030	M02B149	1	18	2

CONFIRMATION NO. 1875

020411  
 THE BOC GROUP, INC.  
 575 MOUNTAIN AVENUE  
 MURRAY HILL, NJ 07974-2064

## FILING RECEIPT



\*OC000000017851553\*

Date Mailed: 01/18/2006

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please mail to the Commissioner for Patents P.O. Box 1450 Alexandria Va 22313-1450. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

## Applicant(s)

Andrew James Seeley, Bristol, UNITED KINGDOM;  
 James Robert Smith, Blackford Somerset, UNITED KINGDOM;

**Power of Attorney:** The patent practitioners associated with Customer Number 020411.

## Domestic Priority data as claimed by applicant

This application is a 371 of PCT/GB03/03670 08/22/2003

## Foreign Applications

UNITED KINGDOM 0219735.8 08/23/2002

**Projected Publication Date:** 04/27/2006

**Non-Publication Request:** No

**Early Publication Request:** No

**Title** UTILIZATION  
 —Utilisation of waste gas streams

**Preliminary Class**

438

**PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES**

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

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Title 37, Code of Federal Regulations, 5.11 & 5.15**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of: Seeley et al.

Attorney Docket No.: M02B149

International Application No. PCT/GB2003/003670

Group Art Unit:

International Application Filing Date: August 22, 2003

National Application Filed: Concurrently Herewith

Title: Utilisation of Waste Gas Streams

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**PRELIMINARY AMENDMENT**

**37 C.F.R. § 1.115**

Dear Sir:

Prior to examining the above-identified application, please amend the above-identified application as follows:

**IN THE SPECIFICATION**

Please amend the title of the patent application as follows:

~~Utilisation~~-Utilization of Waste Gas Streams

Please amend page 1 of the Specification by inserting the following paragraph between the Title and the first paragraph:

National Stage application of International Application No. PCT/GB2003/003670 filed August 22, 2003, which claims priority to Great Britain Application No. 0219735.8 filed August 23, 2002.

### IN THE CLAIMS

1. (currently amended) A process for ~~utilisation~~-utilization of an ammonia-containing waste gas stream from a semiconductor processing step, comprising decomposing ammonia contained in the waste gas stream into hydrogen and nitrogen, passing the gas stream so obtained through a hydrogen separator in order to separate hydrogen gas therefrom, purifying the separated hydrogen gas in a purifier and using the purified hydrogen gas in semiconductor processing.
2. (original) A process according to claim 1, in which the semiconductor processing step is gallium nitride epitaxy, the purified hydrogen gas being recycled for use therein.
3. (currently amended) A process according to claim 1 ~~or claim 2~~, in which the hydrogen separator is a pressure swing adsorption system.
4. (currently amended) A process according to ~~any one of the preceding claims 1~~, in which the purifier is a palladium purifier.
5. (currently amended) A process according to ~~any one of the preceding claims 1~~, in which the ammonia decomposition step comprises contacting the ammonia with a hot catalyst.
6. (currently amended) A process according to ~~any of the preceding claims 1~~, in which the hydrogen gas effluent from the hydrogen separator has a purity of at least 99%.
7. (currently amended) A process according to ~~any one of the preceding claims 1~~, in which the purified hydrogen effluent from the purifier has a purity of at least 99.99%.
8. (currently amended) A process according to ~~any one of the preceding claims 1~~, in which the hydrogen gas effluent from the hydrogen separator is combined with fresh hydrogen before it is purified in the purifier.
9. (currently amended) A process according to ~~any one of the preceding claims 1~~, in which the purified gas effluent from the purifier is combined with further hydrogen and the combined

hydrogen gas stream is ~~utilised~~utilized in semiconductor processing.

Claims 10-13 (cancelled)

14. (new) A process according to claim 2, in which the hydrogen separator is a pressure swing adsorption system.

15. (new) A process according to claim 2, in which the purifier is a palladium purifier.

16. (new) A process according to claim 2, in which the ammonia decomposition step comprises contacting the ammonia with a hot catalyst.

17. (new) A process according to claim 6, in which the hydrogen gas effluent from the hydrogen separator is combined with fresh hydrogen before it is purified in the purifier.

18. (new) A process according to claim 7, in which the purified gas effluent from the purifier is combined with further hydrogen and the combined hydrogen gas stream is utilized in semiconductor processing.

19. (new) An apparatus for manufacture of semiconductor products, having a semiconductor processing device and a waste gas recovery loop for recovery of hydrogen, the waste gas recovery loop comprising an ammonia cracking device for receiving waste gases from the semiconductor processing devices and decomposing ammonia therein to form a cracking device effluent containing nitrogen and hydrogen, a hydrogen separator for separation of hydrogen from the ammonia cracking device effluent, a purifier for purifying the separated hydrogen, and a recycle line for recycling purified hydrogen from the purifier to the semiconductor processing device.

20. (new) An apparatus according to claim 19, in which the semiconductor processing device is a gallium nitride epitaxy chamber.

21. (new ) An apparatus according to claim 20, in which the hydrogen separator is a pressure swing absorption system.
22. (new) An apparatus according to claim 20, in which the hydrogen purifier is a palladium purifier.



**REMARKS**

This application is being filed concurrently with the entry of the National Stage (Chapter I) of International Application No. PCT/GB2003/003670 which claims the priority of Great Britain Patent Application No. 0219735.8 under 35 USC 119.

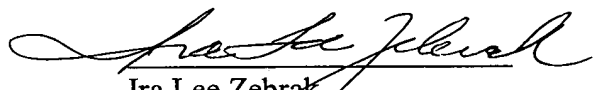
Notably, new claims 19-21 are from cancelled claims 10-13 and only differ from cancelled claims 10-13 in the following ways: (1) any British spellings of words were converted to American spellings; and (2) any multiple dependencies were omitted.

This Preliminary Amendment was considered when calculating the filing fee. Accordingly, the total number of claims specified on the Transmittal Letter is 18 and the number of independent claims is 2.

It is not believed at this time that any additional fee is due. As a precaution, the Commissioner is hereby authorized to charge to Deposit Account No. 02-2865 any additional fee required by this submission.

Respectfully submitted,

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Date: Feb 17, 2005